SVKM's
D. J. Sanghvi College of Engineering

Program: B.Tech in Computer Engineering **Academic Year: 2022** **Duration: 3 hours**
Date: 07.01.2023
Time: 10:30 am to 01:30 pm
Subject: Artificial Intelligence (Semester V) **Marks: 75**

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover page of the Answer Book, which is provided for their use.

(1) This question paper contains two pages.
(2) All Questions are Compulsory.
(3) All questions carry equal marks.
(4) Answer to each new question is to be started on a fresh page.
(5) Figures in the brackets on the right indicate full marks.
(6) Assume suitable data wherever required, but justify it.
(7) Draw the neat labelled diagrams, wherever necessary.

Question No.		Max. Marks
Q1 (a)	Give PEAS description for an Automated taxi agent. Characterize and justify its task environment. **OR** Explain following agent in detail with diagram i. Model based reflex agents ii. Learning agents	[10] [10]
Q1 (b)	What is heuristic function? What are the qualities of a good heuristic?	[05]
Q2 (a)	Explain Depth First Iterative Deepening (DFID) algorithm with a suitable example and analyze its performance. Show tree traversal using DFID. **OR** Demonstrate the working of Hill Climbing algorithm using World block problem and analyze its performance.	[10]
Q2 (b)	Explain the steps in the Genetic Algorithm.	[05]
Q3 (a)	Explain quantifiers in FOL? Demonstrate Unification using suitable example. **OR** Write FOL and CNF statements for the following: i. Every child loves every candy. ii. Anyone who loves some candy is not a nutrition fanatic. iii. Anyone who eats any pumpkin is a nutrition fanatic. iv. Anyone who buys any pumpkin either carves it or eats it. v. John buys a pumpkin. vi. Lifesavers is a candy. vii. If John is a child, then John carves some pumpkin.	[10] [10]
Q3 (b)	Differentiate Forward chaining and Backward Chaining	[05]

Q4 (a)	Explain Partial Order Planning in detail with suitable example. **OR** Illustrate the working of Backward State Space Planning with example in detail.	[10] [10]
Q4 (b)	Explain various Fuzzy set operations.	[05]
Q5 (a)	What is linear separability? Design AND Gate using McCulloch Pitts Model. (Assume suitable weights and input). **OR** Demonstrate the working of Feed Forward Network.	[10] [10]
Q5 (b)	Draw and describe the architecture of Expert System.	[05]